

NOTES ON THE GENUS CRASSULA, II

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SECTION IV. CAMPANULATAE.

PERFORATA GROUP.

Names which have been confused in the literature and in cultivation are *Crassula perfossa* Lam. and *Cr. rupestris* Thunb. with which are associated *Cr. perforata* Thunb., *Cr. punctata* L. and *Cr. punctata* Mill. Schonland recognises two species:

Cr. perforata Thunb. (syn. *Cr. perfossa* DC. (Pl. Gr. t.25) non Lam.).

Cr. rupestris Thunb. (syn. *Cr. perfossa* Lam., *Cr. perfilata* Scop., *Cr. punctata* Mill. and *Cr. monticola* N.E.Br.).

The specific names are correct but the synonymy is confused.

Crassula perforata Thunb.

This species was described by Thunberg in *Nova Acta Acad. Caes. Natur. Cur.* VI (1778): *foliis connato-perfoliatis, ovatis, ciliatis, remotis; caule erecto thyrsifloro*. He found the plant in woods near Swartkops Zoutpan. Linnaeus fils, in the *Supplementum* (1781) omits *ciliatis* and says the inflorescence is *pedunculato-subverticillatis*. Willdenow in his edition of *Species Plantarum* (1797) quotes both Thunberg and Linnaeus fils and in *Enumeratio Plantarum horti regni botanicum Berolinensis* (1809) gives as synonyms *Cr. perfossa* DC and *Cr. perfilata* Scop.

There is no doubt about the identity of *Cr. perforata* Thunb.; it is an erect-growing plant with the thickened, ovate leaves so closely united that they appear to be threaded at intervals up the stem which terminates in a long, interrupted thyrsus with small yellow flowers.

Crassula rupestris Thunb.

Thunberg described this species, which he found at Roggeveld near the Hex River, in *Nova Acta Acad. Caes. Natur. Cur.* IV (1778) also; *foliis connatis, ovatis, integris, glabris, caule tecto; corymbo supradecomposito*. This description was repeated by Linnaeus fils, Lamarck, Willdenow and De Candolle with little or no alteration except that the colour of the flowers was later given as white. In *Flora Capensis* (1862) Harvey gives this species in his list of "Doubtful species unknown to us", although

it is a common plant at the Cape. This plant cannot be confused with *Cr. perforata* since the inflorescence is quite distinct, being a compact corymb terminating each stem.

When describing *Cr. rupestris* Thunb. in *The Flowering Plants of South Africa* XXI, t.839 (1941), Dr. R. A. Dyer says: "For many years *Crassula rupestris* was known by the name *Cr. perfossa* Lam. under which it was referred to by Harvey in *Flora Capensis*. The older name given to the plant by Thunberg was restored by Schonland." The correct name was certainly brought back into use but the fact that *Cr. rupestris* Thunb. and *Cr. perfossa* Lam. were not the same plant was not made clear.

An examination of Harvey's description of *Cr. perfossa* Lam. seems to indicate that parts of two descriptions have been combined, whether intentionally or by some error of transcription it is not possible to say; the leaves are described as "connato-perfoliate", an expression used by Thunberg for *Cr. perforata*; Lamarck in describing *Cr. perfossa* uses a similar expression—"connées et enfilées par les tiges", but the inflorescence is given by Harvey as "cymes lateral, subsessile, dense, oblong or globose" which is not the long interrupted thyrsus of *Cr. perforata* with which *Cr. perfossa* is closely allied if not identical.

***Crassula perfossa* Lam.**

The description by Lamarck appeared in *Encyclopédie Methodique*, II, p. 173 (1786) but he had not seen the flowers. An illustration was given in the *Supplement* to the above by Poirét (1811) and he regarded the species as synonymous with *Cr. perfoliata* Scop. which there is no reason to doubt. Although there are no early illustrations of *Cr. rupestris* or of *Cr. perforata*, there are several of *Cr. perfossa*; Poirét's is a rather poor line drawing but Scopoli gives a good plate in *Deliciae florae et faunae insubricae* (1788) which shows a plant very similar to *Cr. perforata* Thunb.; N. J. Jacquin in *Plantarum rariorum Horti Caesarii Schoenbrunnensis* t.432 (1804) shows the same plant, growing rather more prostrate, under the name *Cr. perfossa* Lam. with *Cr. perfoliata* Scop. as synonym. In *Plantes Grasses*, De Candolle has a plate (t.25) of the same plant with the same synonym. Clearly at the time these two names were regarded as synonymous but in 1809 Willdenow in *Enum. plant. horti regni bot. Berolinensis* also gave as a synonym the name of *Cr. perforata* Thunb. Haworth in *Synopsis Plantarum Succulentarum* (1812) gives as synonyms of *Cr. perfoliata* Scop. (which he uses in preference to Lamarck's earlier name) *Cr. perfossa* DC. and *Cr. punctata* Mill., whilst under *Cr. punctata* L. he excludes Miller's plant of the same name. This brings us to yet another specific name.

***Crassula punctata* L.**

The first description of this species is given in *Systema Naturae*, 10th ed. 1759: "*C. fol. oppositis ovatis gibbis ciliatis supra planis punctatis*" which could apply to a number of plants especially as no mention is made of the flowers. In *Species Plantarum*, 2nd ed. 1762, the flowers are still not described but *Cr. punctata* Mill. is quoted as a synonym; in Willdenow's edition of *Species Plantarum* (1797) the words "*floralia ovata*" are added to the description and Miller's plant again given as a synonym but, as has been mentioned, Haworth did not regard these plants as synonymous; in fact, he thought *Cr. punctata* Mill. was the same as *Cr. perfoliata* Scop.=*Cr. perfoliata* Lam. whilst listing *Cr. punctata* L. as a separate plant.

***Crassula punctata* Mill.**

Miller first described his *Cr. punctata* in the 7th edition of his *Gardeners' Dictionary* in which the Linnaean binomial system was not in use, so that the description in the 8th edition should be used; this reads: *caule flaccido, foliis connatis, cordatis, succulentibus, floribus confertis terminalibus* and in the English text that follows he says that the stems "are terminated by clusters of small white flowers, sitting very close to the top of the stalks", in fact, *Cr. punctata* Mill. is *Cr. rupestris* Thunb.

What *Cr. punctata* L. is, it is hard to say; Lamarck, when describing *Cr. perfoliata*, had already suppressed the name as it did not appear to fit his plant and it is difficult to say now whether it was intended to apply to *Cr. perfoliata* Thunb. or not. Schonland seemed to be in doubt if *Cr. punctata* L. and *Cr. punctata* Haw. were the same plants and suggested that they belonged under *Cr. ramuliflora* Link et Otto; I have seen Haworth's drawing in the Kew collection and it appears to me to represent a young plant of *Cr. perfoliata* Thunb. but it is named *Cr. punctata* Haw.; it has been raised from seed sent by Bowie in 1821.

If Miller had been the first to use the name *Cr. punctata* (1768), it would have had priority over *Cr. rupestris* Thunb. (1778) but the specific name had been used earlier by Linnaeus (1759) for a plant whose identity is now uncertain, therefore the name *punctata* is best abandoned.

It has been mentioned that Willdenow regarded *Cr. perfoliata* Thunb. and *Cr. perfoliata* Lam. as synonymous; this was not accepted by Roemer et Schultes nor by De Candolle in his *Prodromus* but it is probably correct. *Cr. perfoliata* is a variable species in nature and, though I have not seen a form which has quite such thick leaves as *Cr. perfoliata*, the differences are so slight as to be varietal rather than specific.

Crassula monticola N.E.Br.

This is the other name included in the synonymy of *Cr. rupestris* Thunb. by Schonland; a rather small variety of *Cr. rupestris* goes under this name in cultivation but it does not fit the description particularly well. Twenty years ago I received (indirectly) from Kew a plant under the name *Cr. montis-draconis* Dint. but that plant has yellow flowers and belongs to the *Sphaeritis* Section. The plant in question is certainly a form of *Cr. rupestris* Thunb.; the leaves are shorter and broader than some forms and so thick that the upper surface is somewhat convex as well as the lower; the flowers are pink and rather large for the species but agree with Dr. N. E. Brown's dimensions, in fact it seems to agree with his description of *Cr. monticola* so that it may well be a descendant of the plant he described and the erroneous name under which it was received could be a corruption due to a damaged label.

Conclusion: The correct synonymy should be:

Cr. perforata Thunb. (syn. *Cr. perfossa* Lam., *Cr. perfilata* Scop.).

Cr. rupestris Thunb. (syn. *Cr. perfossa* Harv. non Lam., *Cr. punctata* Mill., *Cr. monticola* N.E.Br.).

Cr. rupestris Thunb. has a very wide distribution. Marloth, in *Flora of South Africa*, p. 22, says: "This is a common shrub of the Karroo, from Worcester to Laingsburg and Oudtshoorn, being about one to two feet high. It varies according to locality and one of its forms, which occurs on the cliffs of Table Mountain and Muizenberg, is a much smaller and straggling plant but in foliage and flowers identical with the type from the Karroo." Schonland gives a more easterly extension of its range to near Grahamstown and says: "Frequent variations in the shape and size of the vegetative organs occur." These variations are, indeed, so great that the forms from opposite ends of the range have diverged so far as to appear at first glance distinct species.

Of the plants of *Cr. rupestris* that I have in cultivation, a number have been collected in the wild and their locality is known and recorded; for these I am indebted to Dr. R. A. Dyer, Mr. F. R. Long and Mr. H. Hall and their help is much appreciated. It would appear that the type occupying the eastern end of the range of distribution, as exemplified by plants collected at Plutos Vale, 17 miles from Grahamstown (J. Erens 1978, 10/12/46) sent by Dr. Dyer (Fig. 1) and a similar plant from near Steytlerville sent by Mr. Hall, has the largest leaves: these are glaucous blue, cordate, the lower side convex, the upper side convex near the stem but flat towards the tip; the flowers are generally white. The type common in the Karroo (Fig. 2) has rounder, thicker leaves which are green or slightly glaucous, with a marked red edge, sometimes with



FIG. 1.—*Crassula rupestris* Thunb. (coll. J. Erens 1978, 10/12/46, Plutos Vale, 17 miles from Grahamstown). Leaves glaucous, flowers white.



FIG. 2.—*Crassula rupestris* Thunb. (coll. H. Hall). Common form in the Karroo. Leaves greenish glaucous, edges red; flowers pink.



FIG. 3.—*Crassula rupestris* Thunb. (coll. H. Hall, near Barrydale). Small form: leaves green, edges red, dotted; flowers pink.



FIG. 4.—*Crassula perforata* Thunb. (coll. F. R. Long, near Alice). Leaves narrow, thick, no cilia.

dots also, and with pink flowers. A form with much smaller leaves which are green with red dots and edges also occurs here (Fig. 3); Mr. Hall reported that he saw two or three such bushes amongst the dominant *rupestris* on north-facing slopes near Barrydale. A similar small form was collected by Mr. Hall in the Montagu district but the leaves are rather bluer and the flowers white.

Cr. rupestris Thunb. is an excellent example of a species which shows considerable variation throughout its range without sufficient variation in essential characters to warrant splitting it into distinct species; it would be difficult even to select varietal forms for they intergrade continually and the population should be studied as a whole. The difference in habit between erect and prostrate plants is usually due to the thickness and consequent weight of the leaves. It would be interesting to know how isolated specimens appearing amongst an otherwise fairly uniform population arise, whether as mutations or by cross-breeding of plants showing some varietal differences.

In cultivation the plants remain true to type; when plants differ in size and colouring and, to a small extent, in time of flowering they may need distinguishing names in which case fancy, not botanical, names should be given.

Cr. perforata Thunb. is also somewhat variable in nature, the chief differences being in the proportionate length of the leaf, the thickness, the presence or absence of cilia along the edge and the position of the leaf which is horizontal but in some cases with the tip slightly or markedly deflexed. The stems are erect when young and may remain so, especially if supported by surrounding bushes, or they may fall over and will then root when in contact with the ground. Three plants sent by Mr. F. R. Long showed the chief distinctions found in the leaf: the narrowest was a specimen from Alice (Fig. 4) whose leaves were considerably longer than broad and the edge without cilia, whilst a specimen from Zuurborg was rather wider with short cilia and another, from Uitenhage (Fig. 5), was as broad as long and markedly ciliate. Plants sent by Dr. Dyer show similar deviations. The inflorescence, which is a long interrupted thyrsus, is similar in all specimens, the chief difference being in the length of the pedicels. My first specimens of this plant, of unknown origin but probably from an old collection in this country, agree entirely with Thunberg's description.

Cr. perfoliata Lam., if my specimen (Fig. 6) fairly represents this species, varies from *Cr. perforata* Thunb. in the greater thickness of the leaves, which are without cilia and rather more glaucous; the flower is identical and so is the type of inflorescence. The plant most nearly resembling this that I have received from South Africa was a specimen sent by Dr. Dyer from near Calitzdorp which, unfortunately, failed to root.

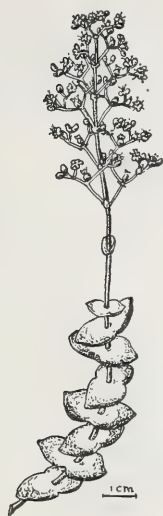


FIG. 5.—*Crassula perforata* Thunb. (coll. F. R. Long, Uitenhage). Leaves wide, thin, ciliate.



FIG. 6.—*Crassula perfossa* Lam. Origin of specimen unknown. Leaves thick, no cilia.

Crassula conjuncta N.E.Br.

In 1902 Dr. N. E. Brown gave this name to a plant sent to Kew by Prof. MacOwan from South Africa in 1896 but the exact locality is not given. In 1910 Dr. Schonland described under the name *Cr. patersoniae* a species which had been collected in 1902 by Mr. E. E. Galpin near Port Elizabeth and in 1909 by Mrs. T. V. Paterson at Bethelsdorp. Later, he regarded the two names as synonymous but, from the description of the inflorescence, they do not appear to be identical.

In his description (Gard. Chron. XXXI, 1902), Dr. Brown says that *Cr. conjuncta* is nearly allied to *Cr. perforata* Thunb., the distinguishing points being: "The leaves are always concave above, never flat or convex, nor recurved as they frequently are in *C. perforata*; they are of a lighter glaucous-green, and the ciliation on their margins is rather longer and denser. The inflorescence is narrower and much more compact, the cymes of which it is composed having much shorter stalks, and the flowers are larger and pure white, not dull yellow as in *C. perforata*." Dr. Schonland, on the other hand, says of *Cr. patersoniae*: "It is very closely allied to *Cr. perforata* Linn. f. [*? perforata*] from which it can be

distinguished at a glance by its shorter and much looser inflorescence which almost resembles a corymb."

I received in 1940, under the name *Cr. conjuncta* N.E.Br., a plant (Fig. 7) which exactly fits the description; since it came indirectly from



FIG. 7.—*Crassula conjuncta* N.E.Br.



FIG. 8.—*Crassula* ? *patersoniae* Schonl.
(coll. H. Hall, near Steytleville).

Kew it is probably a propagation from the plant from which the description was made; the inflorescence is a long interrupted thyrsus with white flowers. In 1948 I received from Mr. Hall two plants collected by him, one at Steytleville (Fig. 8) and the other on a small hill overlooking Fish Hoek on the Peninsula; in both cases I noted on arrival that the leaves resembled *Cr. conjuncta* N.E.Br. in shape and colour but were not so closely united, nor had they the ciliate edge. When they flowered, the inflorescence was a corymb, as in *Cr. rupestris* Thunb. but, instead of being close to the upper pair of leaves, there was a distinct scape 5–6 cm. long bearing 7–8 pairs of bracts. This is probably the plant which Dr. Schonland named *Cr. patersoniae*; I had regarded these two specimens as possible hybrids between *Cr. rupestris* and *Cr. conjuncta* when they first flowered here. Though they came from distinct areas, they are very similar in many ways but the plant from Steytleville has red dots on the upper surface of the leaves which, in both specimens, are

glaucous blue with a conspicuous red edge (like *Cr. conjuncta*) but without the cilia on the margin. Further field work would be necessary to decide the connection between *Cr. conjuncta* N.E.Br. and *Cr. patersoniae* Schonl.; in his description Dr. Brown did not give the precise locality or area of distribution of the former.

***Crassula pearsonii* Schonl.**

This name was proposed by Dr. Schonland for *Cr. brevifolia* Harv. which he regarded as unsuitable. Prof. R. S. Adamson has shown in the *Journal of S. African Botany*, VIII, pt. 4, 1942, that this name change is not valid and the correct name for the plant remains *Cr. brevifolia* Harv. In *Flora Capensis* Harvey says: "Nearly allied to *perfossa* [i.e. *rupestris* Thunb.] but differs in the shape of the leaves and their evidents connation." In cultivation a small form of *Cr. rupestris* sometimes goes under the name of *Cr. brevifolia* which is incorrect; the true species has leaves which are longer than broad, trigynous, flat above and concave below. The flowers are white and the corymb (at least in specimens I have seen) is not so large or close as is usual in *rupestris*.

Two new species, which belong to this group, have been described recently: *Cr. marnierana* Huber et Jacob. and *Cr. nealeana* Higgins.

Cr. marnierana was described by Huber and Jacobsen in *Cactus* No. 31, 1952, Supplement p. 8. In 1949 I received specimens of this plant from Mrs. Bolus and from Mr. Hall under the name and number "Herre 5470" but with no details of locality, and also from Herr Jacobsen who then said it had been collected at "Lategaansvlei, Oudtshoorn". In the published description, the habitat is given as "S.W. Africa, locus incertus—coll. Lategan—e collectione W. Triebner—Windhoek No. 102"; it is also said that the plant is related to *Cr. perforata* Thunb., which is only true in that both belong to the *Perforata Group*; it is much more closely related to *Cr. rupestris* Thunb., being a smaller, more prostrate plant, with very short internodes and a sessile corymb of small white flowers.

Cr. nealeana Higgins has been in cultivation in England for nearly thirty years under the names "*Cr. rupestris minor*" and "*Cr. perfossa minor*", but it is a distinct species which I have described (*National Cactus & Succulent Journ.*, Vol. X, 2, 1955) and named after W. T. Neale, of Newhaven, who received the plant from South Africa some time before 1935. The chief distinction from *Cr. perforata* Thunb. is in the smaller size and prostrate habit and in the short, thyrus-like inflorescence of yellow flowers which is determinate, unlike the long, indefinite interrupted thyrus of *Cr. perforata*.

***Crassula sladeni* Schonl.**

A plant from Little Namaqualand was described by Dr. Schonland under this name in 1912; he says: "This species resembles and is allied to *Crassula lactea* Ait. from which, however, it differs in the shape of the inflorescence, and especially in the floral structure"; he placed it in *Section Stellatae, Lactea Group*.

Mr. Hall sent me a flowering specimen of a large shrubby *Crassula* from the Richtersveld which clearly belonged to the *Perforata Group*, the corymbose inflorescence and the flowers bearing a marked resemblance to *Cr. rupestris* Thunb. but differing in the form of the leaves. Later Mr. Hall reported that he had seen the plant at Stellenbosch where it was labelled *Cr. sladeni* and it appears to agree with the description of this species given by Dr. Schonland except that the petals in my specimen each had a small mucro and the original description says "Petala . . . sine mucrone". Where the mucro is not well developed its presence or absence in different specimens seems variable and, since this is the only obvious distinction, it seems that *Cr. sladeni* Schonl. should be transferred to the *Perforata Group* of *Section Campanulatae*.